

INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 2000	Park: Shenandoah NP
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Permit#: SHEN-1999-N150	
Park-assigned Study Id. #: unknown	
Project Title: BIRD MONITORING: MONITORING AVIAN PRODUCTIVITY AND SURVIVORSHIP (MAPS) IN SHENANDOAH NATIONAL PARK (N-150)	
Permit Start Date: May 01, 2000	Permit Expiration Date Apr 30, 2001
Study Start Date: May 01, 2000	Study End Date Apr 30, 2001
Study Status: Continuing	
Activity Type: Monitoring	
Subject/Discipline: Birds / Ornithology	
Objectives: <p>The major objective is to monitor the primary demographic parameters of landbirds in Shenandoah National Park. Specific objectives are: (1) to establish and operate six MAPS stations in Shenandoah National Park for at least ten consecutive years that will provide: (a) annual indices of adult population size and post-fledging productivity of the breeding landbirds of the park from data on the numbers and proportions of young and adult birds captured; and (b) estimates of adult survivorship and recruitment into the adult population for these species from mark-recapture data on the adult birds captured; (2) to examine long-term trends in population size, productivity, and survivorship among Shenandoah's landbirds and attempt to infer proximate demographic causes for observed population changes; (3) to incorporate these data from Shenandoah into the continent-wide MAPS Program; and (4) to evaluate the usefulness of the MAPS Program as one component of Shenandoah National Park's and the National Park Service's Long-Term Ecological Monitoring efforts.</p>	
Findings and Status: <p>We completed the ninth year of the MAPS Program in Shenandoah National Park. Bird-banding was conducted at each station on seven 10-day intervals between May 31 and August 4. A total of 1,288 captures of 50 species were recorded during the 3920.5 hours operated in 2000, an increase over the 1999 total of 1,213 captures. As in 1993-1999, the capture rate of adult birds was greater at the red oak and higher-elevation stations than at the chestnut oak and lower-elevation stations.</p> <p>Analyses indicated that adult population sizes for all species pooled decreased from 1999 to 2000 by a highly significant -20.2 percent. The pattern of decreases appeared generally to be both species- and park-wide, and likely resulted from low productivity in 1999.</p> <p>In contrast, the number of young birds captured increased highly significantly by +46.4 percent, also on both a species- and park-wide basis. Productivity also showed a near-significant absolute increase, increasing at all six stations. Four species showed significant or near-significant increases between 1999 and 2000, while only one species showed such a decrease. For many species, population sizes and productivity have shown opposite trends; when population sizes increase, productivity decreases, and vice versa. This pattern, seen at many MAPS stations, suggests that increased breeding success leads to higher recruitment, which in turn eventually results in lower reproductive success, and vice versa.</p>	

We calculated eight-year (1993-2000) trends in adult population size for 17 target species. Eleven of these species, as well as all species pooled, showed generally increasing population trends; of these, populations of two species, Wood Thrush and Eastern Towhee, showed significant or near-significant increases. Adult populations of only one species, Indigo Bunting, have demonstrated consistent and significant declines, and we believe that the decline can be attributed to the anomalously high populations present in the beginning of the study period that, in turn, resulted from the gypsy-moth defoliation. It is also possible that populations of some of the other species, especially the mid-canopy species such as Red-eyed Vireo and American Redstart, have increased in response to the recovery of the forests. That the population dynamics are now fairly consistent across species may indicate that the habitat has begun to stabilize, some seven years after the dramatic defoliation event.

We were able to estimate adult survival rates for 17 species, with an average survival estimate of 0.501, ranging from a low of 0.331 for Canada Warbler to a high of 0.883 for Rose-breasted Grosbeak. Time-dependency in estimates of survivorship, capture probability, and/or proportion of residents showed no consistent interannual patterns among the four species for which time-dependent models were selected. With more years of data, temporal effects on survival probabilities may become more meaningful, although it is likely that up to twenty years of data will be necessary to determine actual temporal trends in survivorship.

Results from the first nine years of the MAPS Program in Shenandoah NP indicate that meaningful indices, estimates of primary demographic parameters, and important information on annual changes and longer-term trends in these indices and estimates can be obtained for at least 17 target species; these will be useful for guiding management decisions in the Park. Survival estimates continue to show substantial improvements in precision with the addition of each year of data. We conclude that the MAPS protocol is very well-suited to provide one component of Shenandoah's Long-term Ecological Monitoring program, and recommend that the MAPS Program be continued in Shenandoah National Park indefinitely into the future.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?

No

Funding provided this reporting year by NPS:

21387

Funding provided this reporting year by other sources:

0

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college

Full name of college or university:

N/A

Annual funding provided by NPS to university or college this reporting year:

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